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ABSTRACT

This study argues that positive second-language (L2) data do not necessarily rule out inappropriate L2 grammar. Rather, L2 learners appear to postulate first-language (L1) grammar as an interim theory about the L2, at least in the initial stages of L2 acquisition. The case where L2 grammar intersects L1 concerning time adverbial clauses was chosen as an object of study. A grammaticality judgement test including correct L2 sentences that are compatible with the L1 (CP), ones that are incompatible with the L1 (ICP), and incorrect L2 sentences (TR) that could occur if L2 learners transfer L1 grammar to L2 was devised and given to native speakers of English who study Japanese as a second language. Results indicate that: (1) the L2 learners accept the TR although there is no positive evidence to allow it; (2) they reject ICP in spite of positive evidence to allow it; and (3) this tendency is remarkable especially in the initial stages of L2 acquisition. (Author/VWL)

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Examining the Including and Excluding Roles of Positive Evidence: a Study of a Case Where L2/L1 Grammar Intersects

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Examining the Including and Excluding Roles of Positive Evidence: a Study of a Case Where L2/L1 Grammar Intersects*

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0. ABSTRACT

This study argues that positive L2 data do not necessarily rule out inappropriate L2 grammar. Rather, L2 learners appear to postulate L1 grammar as an interim theory about the L2, at least in the initial stages of L2 acquisition. The case where L2 grammar intersects L1 concerning time adverbial clauses was chosen as an object of study. A grammaticality judgement test including correct L2 sentences which are compatible with the L1 (CP), ones which are incompatible with the L1 (ICP), and incorrect L2 sentences (TR) which would occur if L2 learners transfer L1 grammar to L2 was devised, and given to native speakers of English who study Japanese as a Second Language. The results indicate that: 1) the L2 learners accept the TR although there is no positive evidence in L2; 2) they reject ICP in spite of positive evidence to allow it; and 3) this tendency is remarkable especially in the initial stages of L2 acquisition. These findings support White (1991a, b; 1992) and Trahey and White (1993), and contradict Schwartz and Gubala-Ryzak's (1992) argument that positive L2 data alone should lead to the preemption of inappropriate L1 values.

1. INTRODUCTION

Recent studies arguing that the Subset Principle does not operate in second language (L2) acquisition (Zobl, 1988; White, 1989; Inaba, 1992a, b; Tomita, 1992) have raised new questions about the use of positive and negative evidence in L2 acquisition. Trahey and White (1993) showed empirical evidence that supplying positive evidence in the L2 classroom does not necessarily trigger the appropriate L2 value of a parameter of Universal Grammar. She argued that positive evidence does not serve so effectively to exclude incorrect L2 values.

This paper also argues that positive evidence does not play a role that is sufficient to exclude ungrammatical sentences in the target language (TL). It deals with the acquisition of Japanese time adverbial clauses by native English

speakers studying Japanese as a Second Language (JSL) at a university in Japan.

The intersectional relationship formed by the Sequence of Tenses (SOT) Rule in time adverbial clauses in English, and the Cooccurrence Restriction (COR) in those of Japanese time adverbial clauses were chosen as an object of study. The paper examines the use of positive evidence for its possible contributions both 1) to attain or include appropriate L2 grammar (referred to here as its including role), and 2) to exclude inappropriate L2 grammar (excluding role). Then it presents a hypothesis about interlanguage (IL) development of L2 learners.

The SOT and the COR have not been considered as parameters of UG. This study approaches the theory of principles and parameters in UG on the basis of empirical data from L2 learners, unlike White's recent theoretical studies. It does not apply the method of choosing one parameter of UG and examining principles of language acquisition by experiment. It rather focuses on the correct and incorrect use actually found in L2 learners, and formulates research hypotheses and poses research questions about IL development on the basis of this empirical data. The aim of this study is to look at the implications and gain perspective for UG theory. This approach is based on the assumption that if UG theory is really valid, it should apply to all the peripheral parts of the principles of languages.

2. L2/L1 INTERSECTIONAL RELATIONS

2.1 The Sequence of Tenses and the Cooccurrence Restriction

This section attempts to introduce the grammatical differences in Japanese and English time adverbial clauses in light of the SOT and the COR. The SOT refers to the tense[1] agreement between main and subordinate clauses that occurs in English. Whatever the tense of the main clause, the tense in the subordinate clause should agree with it. English observes this rule, while Japanese does not. There are four possible combinations for both present and past forms in main and subordinate clauses as shown in Table 1. While only two types are grammatical in English as a result of the SOT rule (A and D), all four types of sentences[2] are grammatical in Japanese, although there are slight differences in meaning.[3] The analysis is based on the works of Miura (1970) and Nakau (1976, 1980).

Table 1. Four types of sentences with combination of present and past in time adverbial clauses.

types	subordinate clause	main clause
A	present	present
B	present	past
C	past	present
D	past	past

However, some Japanese time adverbial clauses (conjunctions) observe the COR, meaning that the verb in the subordinate clause always occurs with the same form, present or past, regardless of the tense of the main clause. This paper will refer to subordinate clauses involving a conjunction requiring the present verb form (*-ru/-u*)[4] as present cooccurrence clauses, and those requiring past verb forms (*-ta/-da*), as past cooccurrence clauses. In the former clauses, only sentence types A and B are grammatical, and in the latter ones, only types C and D are grammatical in Japanese.

The *-mae(ni)* ('before') clause is an example of a present cooccurrence clause. Japanese sentences (1a) and (2a) are grammatical, and (3a) and (4a) are ungrammatical, since they violate the COR. On the other hand, the English sentences (1b) and (4b) are grammatical, but (2b) and (3b) are ungrammatical since they violate the SOT. The semantic equivalent of (2a) is (4b) in English.

(* ungrammatical)

(1) a. *Neru maeni* ha o migaku. (Type A)
b. I brush my teeth before I go to bed. (Type A)
(2) a. *Neru maeni* ha o migaita. (Type B)
b. *I brushed my teeth before I go to bed. (Type B)
(3) a. **Neta maeni* ha o migaku. (Type C)
b. *I brush my teeth before I went to bed. (Type C)
(4) a. **Neta maeni* ha o migaita. (Type D)
b. I brushed my teeth before I went to bed. (Type D)

The *-ato(de)* ('after') clause is an example of a past cooccurrence clause. Similarly to the example above, Japanese sentences (7a) and (8a) are grammatical, but (5a) and (6a) are ungrammatical. English sentences (5b) and (8b) are grammatical, but (6b) and (7b) are ungrammatical. Note that the semantic equivalent of (7a) is (5b).

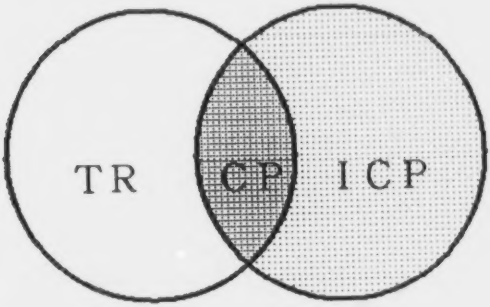
(5) a. *Bangohan o *taberu atode* terebi o miru. (Type A)
b. I watch TV after I have supper. (Type A)
(6) a. *Bangohan o *taberu atode* terebi o mita. (Type B)
b. *I watched TV after I have supper. (Type B)
(7) a. Bangohan o *tabeta atode* terebi o miru. (Type C)
b. *I watch TV after I had supper. (Type C)
(8) a. Bangohan o *tabeta atode* terebi o mita. (Type D)
b. I watched TV after I had supper. (Type D)

2.2 The Intersectional Relation between L1 and L2

The SOT and the COR form one instance of Japanese and English grammar appearing to overlap, or intersect, although the grammatical structure is actually different. As seen in the previous section, English and Japanese share similarities as well as differences, creating an intersectional relationship. In this study, Japanese sentences including the ungrammatical sentences shown above are classified into the following four categories:

1) CP (compatible): sentences grammatical in both L2 and L1.
e.g. sentences (1a)(1b)/(8a)(8b)
2) ICP (incompatible): sentences grammatical in L2 but not in L1
e.g. sentences (2a)(2b)/(7a)(7b)
3) TR (transfer): sentences ungrammatical in L2 but not in L1, representing incorrect Japanese sentences which would occur if L2 learners applied the SOT to L2 sentences.
e.g. sentences (4a)(4b)/(5a)(5b)
4) NP (no positive evidence): sentences ungrammatical both in L2 and L1.
e.g. sentences (3a)(3b)/(6a)(6b)

CP and ICP are available as positive evidence, while TR and NP do not have positive L2 data which support them. Note that NP sentences, which do not exist in either L1 or L2, will not be included in this study, since the purpose of this study is to identify the use of positive evidence. The terms CP and ICP will be used when referring to positive evidence of the same type. The domains of CP, ICP and TR are illustrated in Figure 1.



L1 L2

Figure 1. CP, ICP and TR

3. LEARNERS' ERRORS AND BACKGROUND OF THE STUDY

The learners' errors concerning Japanese tense adverbial clauses seem to be attributable to the over-application of the SOT to present and past cooccurrence subordinate clauses, resulting in COR violations. As for the present cooccurrence subordinate clauses, learners incorrectly generate sentences Type D (defined in 2.1) to convey the sense of Type B, whereas they have no problem generating Type A. Also in the case of past cooccurrence subordinate clauses, they generate Type A for the sense of Type C, while they can correctly generate Type D.

For example, they make sentences like (11a) below, which has an error in the *-mae(ni)* ('before') clause, intending to mean (11b), but the correct Japanese sentence would be (12a). (13a) is an example of the kind of correct sentence learners seem to have no trouble generating.

(11) a. * Nihon ni *itta maeni*, Nihongo o benkyou shita. (Type D)
b. Before I went to Japan, I studied Japanese. (Type D)
(12) a. Nihon ni *iku maeni*, Nihongo o benkyou shita. (Type B)
b. * Before I go to Japan, I studied Japanese. (Type B)
(13) a. Nihon ni *iku maeni*, Nihongo o benkyou shiyo. (Type A)
b. Before I go to Japan, I will study Japanese. (Type A)

Learners also make errors like (14a) below, in the *-ato(de)* ('after') clauses. They want the meaning of (14b), but the correct Japanese sentence to convey this meaning would be (15a). Again, (16a) is an example of correct sentence with which they do not have a problem.

(14) a. * Toshokan ni *iku ato*, kaimono o suru. (Type A)
b. After I go to the library, I will go shopping. (Type A)
(15) a. Toshokan ni *itta ato*, kaimono o suru. (Type C)
b. * After I went to the library, I will go shopping. (Type C)
(16) a. Toshokan ni *itta ato*, kaimono o shita. (Type D)
b. After I went to the library, I went shopping. (Type D)

These incorrect sentences that learners generate do not exist in positive L2 data. Errors of this kind, however, are often found in L2 learners' spoken and written work. Mizutani (1988) also points out L2 learners' errors like this. The fact that learners make errors like these leads us to the following questions:

1) Why do L2 learners generate sentences like TR, despite the fact that there is no positive L2 evidence supporting them?

2) Why don't they allow ICP sentences in their IL, instead using TR in the sense of ICP, although positive L2 data supporting ICP sentences exists? These are the practical background of this study.

4. EXPERIMENTAL DESIGN

4.1 Research Questions

The research consisted of two basic studies. Study I examines the including and excluding roles of positive evidence. The specific research questions addressed in Study I are: 1) whether the subjects can accept CP and ICP, which exist in positive L2 data, and 2) whether they can reject TR, which do not exist in positive L2 data. The operation of the including role predicts the acceptance of CP and ICP, and that of the excluding role predicts the rejection of TR.

Study II investigates IL development. The IL grammar that the learners entertain is considered in three aspects: 1) grammar assumed to be transferred from the L1; 2) appropriate L2 grammar; and 3) grammar which allows both L2 and L1 grammars. The operation of preemption predicts the acceptance of IC and ICP, and the rejection of TR.

4.2 The Test

The grammaticality judgement test used in this study had a correct/incorrect format. The test consisted of four types of Japanese sentences: CP, ICP, TR and NP.[5] The Japanese conjunctions taken up were: *-mae(ni)* (before), *-made* (until), *-tochuu* (on the way to), *-ato(de)* (after). The test sentences can be found in appendix i.

Although Ellis (1991) has criticized some aspects of the grammaticality judgement test, in this case it has the advantage of presenting all four types of sentences to L2 learners.

4.3 Subjects

The subjects consisted of three groups of students with different language proficiency levels. Level I contained thirty-four elementary-level students, Level II, sixteen intermediate-level students, and Level III, ten advanced-level students. The levels were divided according to the placement test given by the university at the beginning of the semester. The language proficiency levels of the subjects correspond approximately to the levels of the Japanese Language Proficiency Test (given by the Association of International Education, Japan) shown in Table 2. Learners underwent a total of about 180 hours of study in this university.

Naturalistic exposure lasted about 15 weeks.

The results of the grammaticality judgement tests at three language proficiency levels (elementary, intermediate and advanced) will be compared and discussed in each study, on the assumption that the higher proficiency levels had undergone longer exposure to positive L2 data through generalized instruction including naturalistic exposure, and also had more general linguistic knowledge. The three levels are also assumed to be three stages of IL development.

Table 2. Subjects

Level	I	II	III	controls
proficiency	elementary	intermediate	advanced	– – –
number	34	16	10	110
instruction (hrs)	180	180	180	– – –
exposure (wks)	15	15	15	– – –
background (yrs)	0.5 to 1	1 to 2	2 to 3	– – –
JLPT level	3	2	1	– – –

*JLPT: Japapanese Language Proficiency Test (Association of International Education, Japan)

5. RESULTS

5.1 Study I

5.1.1 Regarding the Including Role of CP Positive Evidence

Figure 3 shows the percentages of subjects who accepted and rejected CP. The difference between acceptance and rejection is indicated by the z value[6] in Table 3.

All experimental groups attained significantly higher percentages of acceptance than those of rejection. Their performances were similar to the control group. Even Level I attained high percentages, statistically similar to the controls.

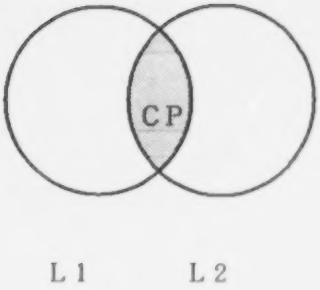


Figure 2. CP domain

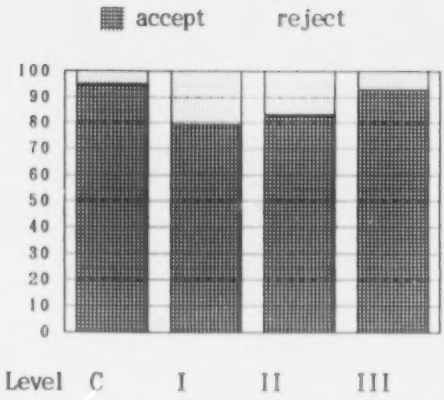


Figure 3. CP accept/reject

Table 3. Percentages of accept/reject for CP

	Controls n = 113	Level I n = 34	Level II n = 16	Level III n = 10
accept(%)	95	79	83	93
reject(%)	5	21	17	7
difference	91	58	66	86
z value	13.53**	4.78**	3.23**	3.85**

(** $p < 0.01$, * $p < 0.05$)

The results indicate that all groups of subjects accept the CP in their IL. Level I learners already entertain CP, presenting the possibilities that they have had it from the beginning as the initial state, or that they picked it up at a very early stage of acquisition..

The data suggest two possible interpretations for the operation of the including role of positive evidence. One is the endowment of positive L2 data, indicating the true operation of the including role of positive evidence. The other would be L1 positive transfer, since CP is consistent with the L1. However, the data shown above are insufficient to determine which of these interpretations is correct.

5.1.2 Regarding the Including Role of ICP Positive Evidence

Figure 5 shows the results for ICP. Level I results show no significant difference between acceptance and rejection, while Levels II and III showed significantly higher percentages of acceptance than rejection (Level II, $z = 2.04$; level III, $z = 1.79$; $p < 0.05$). These results indicate that at higher levels, the subjects increasingly accepted ICP.

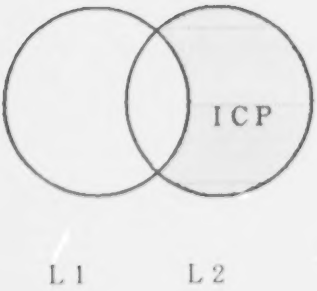


Figure 4. ICP domain

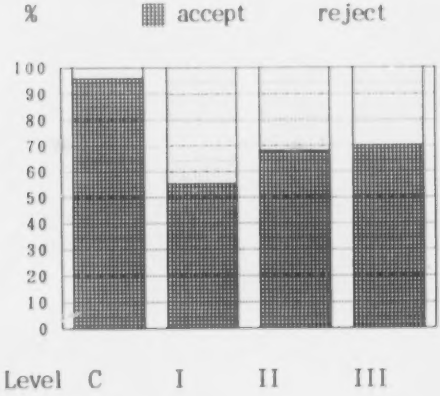


Figure 5. ICP accept/reject

Table 4. Percentages of accept/reject for ICP

	Controls n = 113	Level I n = 34	Level II n = 16	Level III n = 10
accept(%)	96	55	68	70
reject(%)	4	45	32	30
difference	92	10	36	40
z value	13.83**	0.82	2.04*	1.79*

(** $p < 0.01$, * $p < 0.05$)

Thus the including role of ICP appears to operate with higher proficiency levels. But, please note that the subjects in Level I rejected ICP at a rate similar to that of acceptance, despite the presence of positive L2 data supporting ICP. If the learners are conservative enough to follow the grammar obtained from positive L2 data alone, they should not reject ICP. A possible explanation for the rejection of ICP is that they applied the SOT to the L2 as they do in their L1, resulting in the undergeneralization of L2 grammar.

5.1.3 Regarding the Excluding Role of ICP

This section examines the excluding role of positive L2 data. The crucial point in this case is whether or not the subjects could reject TR. Figure 7 shows the results for TR. All of the experimental groups showed a significantly higher percentage of acceptance than the control group (level I, $z = 1.94$; Level II, $z = 3.99$; Level III, $z = 3.29$; $p < 0.05$). They did not significantly differ from each other. Level I and II attained significantly higher percentages of acceptance than rejection (Level I, $z = 2.47$; Level II, $z = 1.81$; $p < 0.05$).

The results from this indicate that subjects in Level I and II have a strong tendency to accept TR, despite the fact that there is no such positive L2 data. Note that the inappropriate TR grammar did not disappear even in Level III.

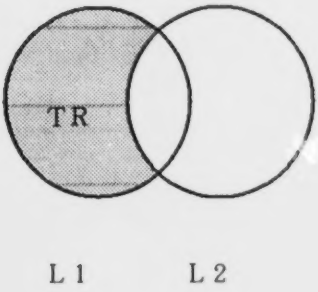


Figure 6. TR domain

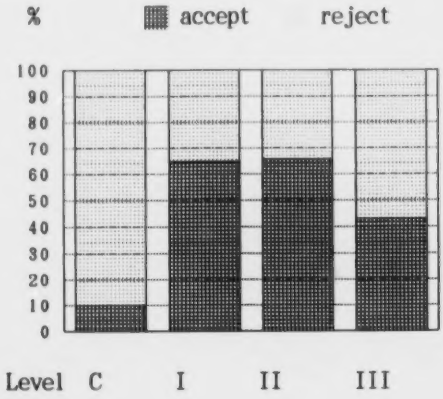


Figure 7. ICP accept/reject

Table 5. Percentages of accept/reject for TR

	Controls n = 113	Level I n = 34	Level II n = 16	Level III n = 10
accept(%)	10	65	66	43
reject(%)	90	35	34	57
difference	-80	30	32	-14
z value	-12.03**	2.47**	1.08*	0.63

(** $p < 0.01$, * $p < 0.05$)

On the basis of this data, the excluding role of the ICP positive evidence does not appear to have operated in this case. In other words, positive L2 data did not suffice for L2 learners to eliminate inappropriate L1 grammar. If positive evidence alone were enough to trigger L2 appropriate grammar, they should have excluded sentences which do not exist in L2 data.

To summarize the results of Study I, the including role of positive evidence was suggested, but the excluding role of positive evidence appeared not to operate so effectively.

5.2 Study II

5.2.1 IL Analyses

To explore IL development, the same data was analyzed in the following different ways:

1) Subjects who accepted both TR and CP but rejected ICP. The results were interpreted to mean that they based their grammaticality judgement on their L1 (referred to as the "transfer group").

2) Subjects who accepted both CP and ICP but rejected TR. They entertained correct L2 grammar ("success group").

3) Subjects who accepted all TR, CP and ICP. They allowed both L2 and L1 at the same time ("neutral group").

4) Subjects whose choices did not belong to either of these three groups ("others").

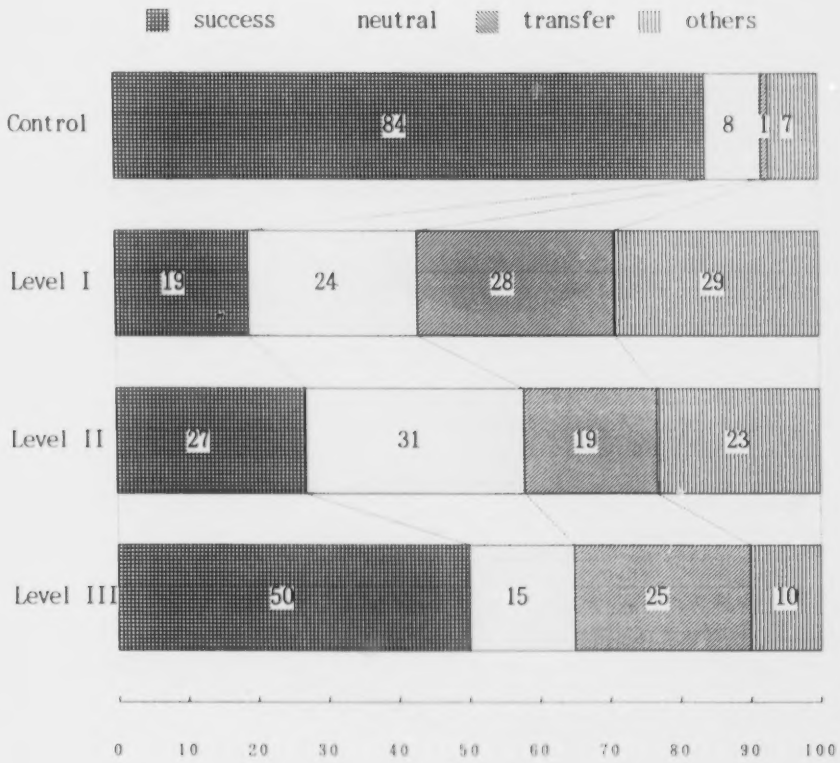


Figure 8. Percentages of success/neutral/transfer/others groups

5.2.2 Regarding TR Grammar

In Figure 8, the transfer group in Level I attained statistically similar percentages to the success and the neutral groups. Level III did not show a significant decrease in percentages.

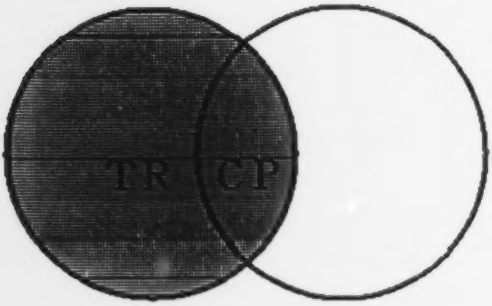


Figure 9. TR grammar

The results indicate that they incorrectly assumed TR grammar to be appropriate for L2. This tendency was found at all levels. It suggests that they hold TR grammar in the early stages of acquisition, and higher proficiency levels did not necessarily eliminate the TR grammar. This supports the argument that L2 learners do not always utilize positive evidence alone. Instead, they appear to postulate TR grammar before they have arrived at appropriate L2 grammar.

5.2.3 Regarding Preemption

The success group shown in Figure 8 attained quite low percentages in Level I, but a significant increase was found between Levels I and III ($z = 1.96$, $p < 0.05$). This indicates that the subjects who entertained appropriate L2 grammar have increased with higher proficiency levels.

However, preemption did not operate so effectively in this case, since the success groups in Level I and II attained lower percentages than the totals of the transfer and the neutral groups. Note that inappropriate L1 transferred grammar still exists even at the advanced level.

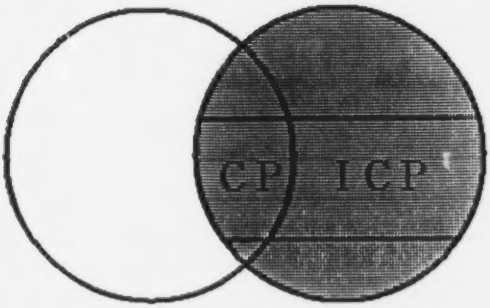


Figure 10. L2 grammar

5.2.4 Regarding the Coexistence of L2/L1 Incompatible Grammar

In figure 8, the neutral groups in Level I and II attained statistically similar percentages to the transfer and the success groups. The results indicated that L2 learners did hold two incompatible grammars at the same time.

However, the fact that the neutral group in Level III attained significantly lower percentages than the success group ($z = 1.71$, $p < 0.05$) indicates that they gradually trigger L2 correct grammar.

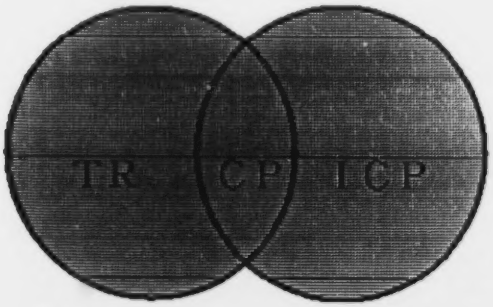


Figure 11. Neutral grammar

5.2.5 IL Development Hypothesis

The results from the study show that there are some subjects who entertain both L2 and L1 grammar at the same time, and this tendency decreases with higher proficiency levels. The results indicate the possible coexistence of both grammars at the same time. Thus, the following hypothesis is advanced: in L2 acquisition, at first learners assumed L1 grammar settings, then changed to the L2/L1 grammar coexistence as a transitional stage, finally triggering appropriate L2 grammar, eliminating inappropriate (L1 transfer) settings. This is illustrated in Figure 12.

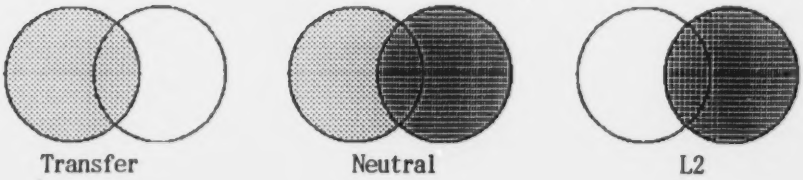


Figure 12. IL development hypothesis

6. DISCUSSION

The results from this study indicate that positive evidence is not available enough to exclude inappropriate L2 grammar, but it is available to include L2 grammar. These results are similar to those of Trahey and White (1993), in that supplying positive L2 data did not lead the L2 learner to discover

ungrammaticality in L2, although the methodology and approach to theory in the two studies is different. The subjects of this study were exposed to positive evidence through classroom and naturalistic environments for a longer period, while White's subjects underwent positive evidence in the classroom intensively. The TL is Japanese, rather than English. The target grammar, SOT and COR, is not a parameter of UG, while the verb movement parameter (Pollock, 1989) in White's study was one of the UG parameters.

On the other hand, the results of this study differ from Trahey and White (1993) in that preemption occurred to a small degree as the proficiency level increased, in the sense that the number of subjects who entertained appropriate L2 grammar increased, not that TR holders decreased. That is, the L2 learners did trigger correct L2 grammar with the increase of their proficiency levels, but it was not stronger than the TR grammar.

However, another possible explanation for the cause of preemption cannot be denied. In this study, neither the classroom instruction nor the textbooks explained that Japanese does not observe the SOT, and there was no special instruction about the SOT either. There were no examples to show incorrect Japanese sentences to the subjects. That does leave the possibility that there was some negative evidence from naturalistic exposure or other influences outside the classroom. If this were the case, this study cannot be used to support the operation of the excluding role of positive evidence.

The operation of the including and excluding roles of positive evidence would never predict TR grammar. The fact that the subjects in this research entertained TR grammar in their IL leads to the hypothesis that they based their grammaticality judgements on their L1.

However, the data obtained from this research did not suffice to ascertain that the TR grammar was due to L1 transfer. A crosslinguistic study of the SOT should determine whether or not TR grammar is, in fact, a transfer from the L1.

Inaba (1993)[7] found that the including role of ICP positive evidence was not strong enough to trigger more inclusive L2 grammar. In contrast, the results of this study did support the operation of the including role of ICP. One possible reason for this might be the COR. The time adverbial clauses which observe COR seem to be a kind of chunk expression, thus the positive L2 data that L2

learners encounter always has the same form (i.e. present form for *-mae(ni)*, and past form for *-ato(de)*). It might, then, have helped the L2 learners to be aware of the COR.

The IL analyses lead to the possible conclusion that L2 learners initially approach L2 data from the perspective of the TR grammar setting. That is, the L2 learners' default L2 grammar might be the TR. If this were the case, it indicates that the grammar which L2 learners entertained previously dominates the grammar which exists in their L2 exposure.

Another finding was that L2 learners entertained both L2 and TR grammar at the same time. These results contradict the claim by Rutherford (1989) that input data incompatible with the initial parameter setting will force resetting the parameter to the appropriate L2 value. Schwartz and Gubala-Ryzak (1992) also argue that there should be no stage at which the L2 learners maintain two settings at a time, since the L2 parameter setting should be mutually exclusive in the grammar of a language learner. Although the SOT is not a parameter of UG, it contradicts their argument that L2 learners should not allow two grammars at the same time in their IL.

7. CONCLUSION

This study concludes that positive evidence would be available in helping L2 learners reset the grammar that they previously held to the TL. However, there is still a lot of investigation to be done in the field of tense and aspect, including SOT.[5] Few studies have been done especially about SOT in time adverbial clauses. Markedness and unmarkedness concerning SOT are still an open question. Hopefully, the approach in this study will provide some perspective for further theoretical research.

Otsu (1990) pointed out that the theory of UG will not lead to the direct application to language education. Although this study's approach has a disadvantage in that it does not directly examine the principles of UG in L2 acquisition, it has the advantage in its possible application to L2 education. It can provide some perspective to Japanese Language Education for native speakers of English as well.

Notes

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1 The term 'tense' is used to represent a syntactic category in this paper, following Nakau (1976, 1980), although there are some other possibilities for Japanese tense and aspect interpretation.
2 Inaba (1993) studied the case of *-toki* ('when') clause which allows these four types of sentences in Japanese.
3 This is attributed to the functional differences of the tense systems of both languages. Further information about the differences among these four types of sentence can be found in detail in Miura (1970) and Nakau (1976, 1980).
4 The Japanese *-ru/-u* form represents present/future, but refers to the present tense here.
5 The test included other sentences dealing with other questions than the test sentences in this research.
6 The formula used in this study (Butler 1985)

$$P_p = (f_1 + f_2) / (N_1 + N_2)$$

$$z = (p_1 - p_2) / (\sqrt{p_p (1 - p_p) (1/N_1 + 1/N_2)})$$

p is the proportion of items having the property.
N is the sample size.
f is the frequency.
z is a z score.

The significance is assessed at the five percent level or less with a one-tailed test. The five percent significance value of the nomal distribution is 1.64, and one percent, 2.33.
7 Part of the subjects in this study were in common with Inaba (1993).
8 Enç (1987) dealt with the SOT, but he did not refer to it in time adverbial clauses.

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Appendix i

All the sentences were inscribed in Japanese. The English translations given here (for correct sentences in Japanese only) were not in the test.

(17) a. Tomodachi ga kuru maeni kaeru.
(I will go home before my friend comes.)
b. Tomodachi ga kuru maeni kaetta.
(I went home before my friend came.)
c. Tomodachi ga kita maeni kaeru.
d. Tomodachi ga kita maeni kaetta.

(18) a. Tomodachi ga kuru made, 30 pun matsu.
(I will wait until my friend comes.)
b. Tomodachi ga kuru made, 30 pun matta.
(I waited until my friend came.)
c. Tomodachi ga kita made, 30 pun matsu.
d. Tomodachi ga kita made, 30 pun matta.

(19) a. Ie ni kaeru tochu, honya ni yoru tumorida.
(When I go back home, I will stop by a bookstore.)
(or I will stop by a bookstore on my way back home.)
b. Ie ni kaeru tochu, honya ni yotta.
(When I went back home, I stopped by a bookstore.)
(or I stopped by a bookstore on my way back home.)
c. Ie ni kaetta tochu, honya ni yoru tumorida.
d. Ie ni kaetta tochu, honya ni yotta.

(20) a. Tomodachi ga kita atode, kaeru.
(I will go home after my friend comes.)
b. Tomodachi ga kita atode, kaetta.
(I went home after my friend came.)
c. Tomodachi ga kuru atode, kaeru.
d. Tomodachi ga kuru atode, kaetta.

Appendix ii

Data

Table 6. Percentages of accept/reject for the test sentences

Sentence no.	Controls n = 113	Level I n = 34	Level II n = 16	Level III n = 10
17a	97/3	91/9	88/12	100/0
17b	98/2	76/24	69/31	80/20
17c	14/86	50/50	62/38	20/80
17d	0/100	29/71	19/81	0/100
18a	94/6	76/24	56/44	80/20
18b	98/2	38/62	44/56	50/50
18c	4/96	82/18	88/12	70/30
18d	0/100	24/76	25/75	0/100
19a	98/2	76/24	100/0	100/0
19b	100/0	44/56	88/12	90/10
19c	9/91	71/29	69/31	30/70
19d	2/98	62/38	25/75	10/90
20a	92/8	74/26	88/12	90/10
20b	88/12	62/38	69/31	60/40
20c	12/88	56/44	44/56	50/50
20d	4/96	29/71	61/39	20/80

Table 7. Percentages of success/neutral/transfer/others for the test sentence

Sentence no	groups	Controls	Level I	Level II	Level III
17	success	81	38	31	70
	transfer	0	15	25	10
	neutral	14	29	25	10
	others	5	18	19	10
18	success	90	6	0	20
	transfer	1	47	25	40
	neutral	2	18	25	20
	others	7	29	50	20
19	success	90	9	31	70
	transfer	0	21	12	10
	neutral	8	32	56	20
	others	12	38	1	0
20	success	74	24	44	40
	transfer	2	29	12	40
	neutral	8	15	19	10
	others	16	32	25	10